UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,021	12/14/2001	Stephen J. Yutkowitz	24914-134	7776

24256	7590	07/19/2004

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EXAMINER
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ART UNIT	PAPER NUMBER
2121	7

DATE MAILED: 07/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05 April 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-20 are presented for further examination.

Response to Arguments

2.   Applicants arguments with respect to claims 1-20 have been considered, but are

moot in view of the new grounds of rejection, as set forth below in this office action.

Claim Rejections - 35 USC § 101

3.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

As per claims 1-15, the claimed invention is directed to non-statutory subject

matter. That is, claims 1-15 set forth a system that is not computer dependent since all

of the claimed feature may be implemented by way of a manual tuning technique, a

technique the applicant readily discloses as being known at the time the invention was

made (page 3; lines 1-10) and this system is not applicable in the related technological

arts and therefore represents non-statutory subject matter.

Claim Objections

4.   As per claim 5, line 1, the phrase "can determine" renders the claim indefinite it is

unclear whether the limitations following the phrase are part of the claimed invention.

See MPEP § 2173.05(d).

As per claims 10-12, specifically claim 10, this claim does not further limit the

parent claim from which it depends (claim 1). Claims 11 and 12, respectively, have been

examined as being both dependent from claim 1 in light of the aforementioned

discrepancy.

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 7, 10, 13-14 and 19-20 are rejected under 35 U.S.C. 102(e) as being

anticipated by Christ et al., U.S. Patent No. 6,658,370.

As per claims 1, 10, 13-14 and 19-20, Christ teaches an automatic tuning method

which adequately teaches the claimed invention as set forth by way of pending

independent claims 1, 10, 13-14 and 19-20. That is, all of the claimed features,

including the tuning of a feed forward parameters, based on error determinations,

wherein tuning takes place periodically over time, so that optimal tuning constants may

be found for a servo motor are adequately taught by way of Christ (e.g. Abstract and

Figure 1 and C1 L10-52 and C4 L64-C5 L13 and C5 L33-41 and C6 L50-55; claim 1).

Furthermore, it is noted that an initial value, an initial movement, a test routine, a

potential value, a second movement and determining an error with the movements and

repeating this until optimum values are obtained for tuning constants [claimed steps a)-l]

are all features that are inherent to Christ since there must be values which are used for

the first values and since the movements of each axis, are measured periodically over

time, so that new tuning constants may be used if an error is deemed to be outside an

acceptable threshold.

Furthermore, with regards to claim 14, a position command generator, a feed

forward command generator, a controller and a feed forward tuning unit are all

adequately disclosed by the teachings of Christ (e.g. Abstract and Figures 1 and 2; C1

L10-52; C4 L64-C5 L13 and C5 L33-41 and C6 L50-55; claim 1) since these features

must be present in order for the system to accomplish the disclosed functions of tuning

a controller for a system.

As per claim 17, Christ teaches the features of claim 14 being incorporated into a

computer numerical control unit and the controller controlling a servomechanism (Figure

2 and Abstract and Title).

As per claim 2, Christ teaches more than one tuning parameter being utilized

(e.g. Figure 2 elements 245 and 255 and C4 L63-C5 L14).

As per claim 3, Christ teaches the use of a time shift tuning parameter (e.g. C5

L9-13; "to reduce following error", which is known in the art as a delay or lag in the

control system) and standard tuning parameters associated with a traditional PID

controller (e.g. C4 L64- C5 L8; "proportional gain").

As per claim 7, Christ teaches the determination of a following error (e.g. C5 L9-

14).

Claim Rejections - 35 USC § 103

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-5, 8-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Christ et al, in view of Official Notice.

As per claim 4, although Christ does not specifically teach determining certain

tuning parameters before running the tuning method, this obvious variation would only

add to the desired abilities of Christ since it would provide a system with fewer

computations that would otherwise need to be done in real time and this has the

obvious effect of saving time during the tuning method, and this would have been

obvious to one of ordinary skill in the art at the time the invention was made.

As per claim 5, the applicant appears to be claiming a feature whereby the

motion control system provides a user with the capability of determining optimum values

without using them during normal operations of the actual system, or, in other words,

off-line. Further, the applicant then appears to also claim a feature whereby the system also has the capability of temporarily using the determined optimum values, regardless of whether the user determines that they should be used, or not, during normal operation of the system. This is confusing and seems contradictory in nature. This claim, as best understood, claims a feature whereby a user may make a determination that is always overridden by the use of each new tuning parameter and this feature is adequately disclosed by Christ since the tuning parameters of Christ are always automatically used based on the computer system calculating deviations, or errors, with respect to thresholds and therefore, a users input is not required.

As per claims 8-9, Official Notice is taken with respect to minimization algorithms and root square means for error determinations as these are both well known mathematical techniques that are used for solving complex calculations, such as those encountered in a typical feed-back feed-forward controller, these calculations otherwise requiring an enormous amount of time to calculate by hand, and the inclusion of this features into Christ would have been obvious to one of ordinary skill in the art at the time the invention was made.

As per claims 11-12, Official Notice is taken with respect to averaging values to determine a change or calculating percentage changes with respect to error determinations are both features that would have been obvious to one of ordinary skill in the art at the time the invention was made since they would allow for a well known

means of ascertaining the magnitude of respective errors, using known mathematical

equation solving techniques, associated with the movements of each axis, so that the

errors associated with each axis may be found in a very fast manner through utilization

of complex computer calculations

7.   Claim 6 is rejected as being unpatentable over Christ in view of Heiman, U.S.

Patent No. 6,604,211.

As per claim 6, Christ does not specifically teach a test routine to be a sinusoidal

waveform for commanding movement of an axis.

Heiman teaches an actuating method for an axis to utilize a sinusoidal waveform

for actuations of a particular axis (e.g. C2 L43-65).

It would have been obvious to one of ordinary skill in the art at the time the invention

was made to have incorporated the teachings of Heiman into Christ for the porpoise of

allowing for the output frequencies to be analyzed so that the error(s) may be effectively

and quickly ascertained.

8.   Claims 15-16 are rejected as being unpatentable over Christ, in view of Blevins

et al., U.S. Patent No. 6,445,962.

As per claims 15-16, Blevins teaches the use of a data communication network

using a hypertext transfer communications protocol for the purpose of sending the

tuning software to a remote location though the use of the Internet (e.g. C17 L39-52).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the teachings of Blevins into Christ so as to provide a way of tuning the system regardless of the geographical location of an operator or technician.

9.   Claim 18 is rejected as being unpatentable over Christ in view of Gabara, U.S. Patent No. 6,307,443.

As per claim 18, Christ does not specifically teach tuning using a finite state machine.

Gabara teaches the use of a tuner wherein the tuner utilizes finite state machine and the inclusion of this feature into Christ would have been obvious to one of ordinary skill in the art at the time the invention was made so to provide a means by which maximum power may be achieved during the tuning process.
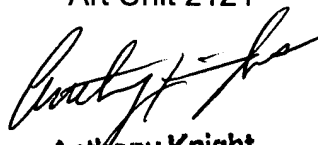
Conclusion

10.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronald D Hartman Jr. whose telephone number is 703-308-7001. The examiner can normally be reached on Mon. - Fri., 11:30 am - 8:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 703-308-3179. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the
Patent Application Information Retrieval (PAIR) system. Status information for
published applications may be obtained from either Private PAIR or Public PAIR.
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you have questions on access to the Private PAIR system, contact the Electronic
Business Center (EBC) at 866-217-9197 (toll-free).

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